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May 6, 2002

Ms. Kristy Chew
Siting Project Manager
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

RE: Data Responses, Set 3B
Cosumnes Power Plant (01-AFC-19)

On behalf of the Sacramento Municipal Utility District, please find attached 12 copies and one original of the Data Responses, Set 3B, in response to Staff's Data Requests dated April 5, 2002.

As part of this data response, 3 copies of the Davis Environmental Exhibit 1 (Data Request #203) and 3 copies of the current wetland delineation maps and data sheets (Data Request #206) are also being submitted.

In addition, 5 sets of responses to Data Requests 186, 187 and 241 are being submitted under a request for confidentiality.

Please call me if you have any questions.

Sincerely,

CH2M HILL

A handwritten signature in blue ink, reading "John L. Carrier, J.D.", written over the printed name and title.

John L. Carrier, J.D.
Program Manager

c: Colin Taylor/SMUD
Kevin Hudson/SMUD
Steve Cohn/SMUD

COSUMNES POWER PLANT (01-AFC-19)

DATA RESPONSE, SET 3B

(Responses to Data Requests: 184, 185, 186, 187, 188, 190, 197, 198, 200, 201, 203, 206, 207, 220, 230, 231, 232, 241, 242, 244, 245, 246, 247, 248, 249, 250, and 251)

Submitted by

**SACRAMENTO MUNICIPAL
UTILITY DISTRICT (SMUD)**

May 6, 2002



2485 Natomas Park Drive, Suite 600
Sacramento, California 95833-2937

COSUMNES POWER PLANT (01-AFC-19)
DATA RESPONSES, SET 3B

Technical Area: Air Quality

Author: Tuan Ngo, P.E.

CPP Authors: Sierra Research

BACKGROUND

It has come to staff's attention that SMUD is in the process of negotiating an offset package with the Sacramento Metropolitan Air Quality Management District (SMAQMD) and other air districts, which involves the use of modeling analysis to derive a ratio for inter-pollutant trade-offs. Because of the complexity of the modeling, and to facilitate staff's air quality analysis of the project, staff should be involved in the discussions with other regulatory agencies.

DATA REQUEST

184. Please provide all correspondence, including those by means of electronic communications, with all air districts, the ARB, and the EPA that are related to the securing and use of offsets, and the development of the modeling analysis to derive the inter-pollutant offset ratio.

Response: The response to this data request is being filed under a request for confidentiality.

185. Please provide any additional information regarding offsets that were not discussed in the application for certification (AFC), but are being considered by the applicant.

Response: The response to this data request is being filed under a request for confidentiality.

Technical Area: Biological Resources

Authors: Melinda Dorin and Rick York

CPP Authors:

BACKGROUND

In the AFC page 8.2-15, in the Impacts to Trees section it states that impacts to trees are unlikely, but if it becomes necessary to remove tree(s) then the loss will be mitigated in accordance with the appropriate requirements specified by the County Tree Coordinator. However, Sacramento County has a Tree Preservation Ordinance (SCC 480 §1, 1981) to protect heritage trees.

DATA REQUEST

186. Provide a figure that shows where heritage trees are located along the proposed pipeline that may be impacted by construction activities (e.g., trenching, boring, heavy equipment maneuvering with a tree's dripline).

Response: There are relatively few heritage trees along the proposed alignment. A preliminary survey based on the alignment as it is proposed was performed on May 2, 2002. The survey identified several trees that potentially qualify as heritage trees under the City of Sacramento definition. Trees that qualify may also occur in the Cosumnes River riparian corridor, but these were not individually enumerated, since the proposed construction method (HDD) would effectively avoid these trees. The technical memorandum reporting the location of known heritage trees is attached here as Attachment BR-186.

187. If any heritage trees are identified along the proposed pipeline, discuss measures that will be taken to mitigate any impacts.

Response: For any heritage tree located along the pipeline corridor that could be affected by construction, the following measures would be instituted to avoid or reduce adverse impacts:

- No trenching, grading or paving would be allowed within the dripline of any heritage tree without specific authorization by the CEC CPM.
- No change, by more than 2 feet, of any grade elevation will occur within 30 feet of the drip line area of heritage tree as a result of construction.
- Motor vehicle will not be parked or operated within the dripline of any heritage tree.
- No equipment or construction materials will be placed or stored within the dripline of any heritage tree.

COSUMNES POWER PLANT (01-AFC-19)
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- No signs, ropes, cables or any other items will be attached to any heritage tree.
- No cutting, trimming or removal of any branches shall be removed for temporary construction purposes.
- No oil, fuel, concrete, mix or other deleterious substance will be placed or allowed to flow into or over the drip line area.

BACKGROUND

Table 8.14-8 in the AFC lists all of the potential wetland areas that will be crossed by the proposed gas pipeline. The table includes information on the type of wetland area, and how and when it will be crossed. Figures 6.1-1 through 6.1-6 from the AFC depict the proposed gas pipeline route and what methods will be used to lay the pipe. Staff needs more information on the crossings to analyze potential impacts to Biological Resources.

DATA REQUESTS

188. Provide an updated table that includes all of the following: any changes to the methods used to cross wetland areas from that presented in the AFC, the amount of habitat disturbance (acreage) at each crossing, bore length where appropriate, and the anticipated distance from the water's edge to the bore site.

Response: Unfortunately, with the volume of data that is being addressed, this information is not yet available. However, it is expected that approximate numbers will be available by May 15, 2002.

BACKGROUND

The proposed gas pipeline will cross the Cosumnes River Preserve owned and managed by The Nature Conservancy and land owned by the California Department of Fish and Game (CDFG).

DATA REQUEST

190. Provide a letter from the Cosumnes River Preserve Manager that states that they have been consulted about the alignment of the gas pipeline and outlines any potential outstanding biological issues on the Cosumnes River Preserve that need to be addressed.

Response: A letter is attached to this response as Attachment BR-190.

COSUMNES POWER PLANT (01-AFC-19)
DATA RESPONSES, SET 3B

BACKGROUND

In Section 5.3 (Transmission Interconnection) of the AFC it states that 0.4 miles of transmission line will be constructed to tie in to the existing Rancho Seco Plant switchyard. Figure 5.3-1 depicts the proposed transmission line route on a map with a 1"= 2000' scale. Staff needs more detailed information to address potential impacts to biological resources.

DATA REQUESTS

197. Provide a new figure at a scale of 1"=500' that depicts the proposed transmission line tower footings, and sensitive species and habitats at a radius of 1,000 feet from the tower footings.

Response: Figure 8.2-1 of the AFC shows this area at a reduced scale. A revised Figure at 1" = 500' is attached (Figure BR-197a). Since this figure is not on an aerial photo base, Figure BR-197b is also provide which shows the locations of the transmission towers on an aerial photo.

198. Provide information on construction impacts from the transmission line towers. Calculate and provide the amount of (acreage) temporary and permanent disturbance.

Response: Table BR-198 quantifies the acreage of disturbance from transmission line towers that are outside the project site footprint. This information supercedes estimates provided in Table 8.2-4 of the AFC and differs from that provided in Data Response, Set 3A in that the temporary impacts were not doubled for 2 sets of towers.

COSUMNES POWER PLANT (01-AFC-19)
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TABLE BR-198

Construction impacts from transmission line towers.

Feature	Details of Use	Size	Temporary	Permanent
Length	0.4 miles from CPP to RSP	230 kV	-	-
Construction Type	Monopole	-	-	-
Tower Footings	Four monopoles outside the project footprint will be supported on 4 concrete foundations	4 at 6' diameter (113 sq. ft.) x 20 feet deep	-	0.002 ac
Tower Assembly	Temporary construction area 150' square at each of 2 tower locations. Each location serves 2 towers.	2 at 150 feet square (22,500 sq. ft.)	1.03 ac	
Access to String Wires	Wires will be strung from RSP and from project site	0	0	0
Total			1.03 ac	0.002 ac

BACKGROUND

At the Data Response Workshop on February 24, 2002 there was a discussion between staff and EJ Koford about the response to Data Request 8 and the anticipated schedule for the federal lead agency to initiate consultation. Table BR-8 shows the anticipated consultation schedule as well as two potential lead agencies. It was stated during the Data Response Workshop that the U.S. Army Corps of Engineers (ACOE) will act as the federal lead agency for the project, but that has not been confirmed.

DATA REQUESTS

200. Provide a letter from the ACOE that they will act as lead agency for the Cosumnes Power Plant Project and consult with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS).

Response: The ACOE provided an email confirmation of previous verbal communications that they would take lead status (Attachment BR-200).

201. Provide a new proposed schedule that identifies when the Biological Assessment will be submitted to the USFWS and NMFS, and when CDFG permits (2081 and 1601) and Regional Water Quality Control Board 401 certification applications will be submitted.

Response: The following table shows our best estimate of when various permits applications would be submitted. Regarding the BA specifically, since the

COSUMNES POWER PLANT (01-AFC-19)
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submittal of the Biological Assessment is the responsibility of the Army Corps of Engineers, the Applicant can only provide its best estimate.

TABLE BR-201
Anticipated Permit Schedule

Permit	Scheduled Submittal
Section 404, Section 10 CWA	May 10, 2002
ACOE submits BA to USFWS, NMFS	June 1, 2002
Streambed Alteration (Section 1600)	June 20, 2002
Section 401 CWA	July 8, 2002
CDFG Incidental Take 2081.1	May 10, 2002

BACKGROUND

A Wetland Delineation Report for the Proposed South Sacramento Power Plant at Rancho Seco, Sacramento County, California by Davis Environmental Consulting was submitted with the Response to Data Request 18 on February 4, 2002. The Figure Exhibit 1 accompanying the report was not included.

DATA REQUEST

203. Please provide a copy of the Figure Exhibit 1 from the Davis Environmental Consulting report.

Response: Three copies of Exhibit 1 are provided as Attachment BR-203.

BACKGROUND

Data Response 20 (Set 1H) provided figures depicting wetland areas located within 125 feet of the 26-mile natural gas alignment and a very general summary of the wetlands.

Data Requests 19 and 20 requested a figure (with a scale of 1"=100') outlining the vernal pools and where jurisdictional wetlands occur within 250 feet of the linear facilities and a table that estimates the amount of wetland habitat that may be directly or indirectly impacted with a 250-foot buffer surrounding vernal pools, respectively.

DATA REQUEST

206. Please provide the wetland delineation surveys that were completed for the alignment. Include a figure with the delineation points mapped, the wetland delineation sheets that were completed, a timeline for when the wetland

COSUMNES POWER PLANT (01-AFC-19)
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delineation will be submitted to the Army Corps of Engineers for jurisdictional wetland classification, and a discussion of when consultation with the USFWS is expected.

Response: Wetland delineation maps have been prepared for the pipeline alignment for a distance of 75 feet on each side of the centerline of construction. These maps and supporting data sheets are being submitted for the CEC's use on an interim basis until the orthographic corrected photos are available around the first part of June. Three sets are provided here for the CEC staff as Attachment BR-206.

The Applicant anticipates submitting the wetland delineation to the Army Corps of Engineers on May 9, 2002.

Regarding estimated timing of consultation with USFWS, please see Data Response #201.

207. Please provide a figure and table that satisfies the requests of Data Requests 19 and 20.

Response: Wetlands in the project area are shown on Exhibit 1 of the wetland delineation report prepared by Davis Environmental Consulting, Attachment BR-203. Wetlands along the gas line corridor are provided as an interim response in Attachment BR-206. See Data Response #188 for an estimate of the wetland acreage.

COSUMNES POWER PLANT (01-AFC-19)
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Attachment BR-186

Heritage Tree Memo

COSUMNES POWER PLANT (01-AFC-19)
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Attachment BR-190
Letter from Cosumnes Preserve



April 8, 2002

Cosumnes River Preserve
13501 Franklin Boulevard
Galt, California 95632

International Headquarters
Arlington, Virginia

TEL 916 683-2142
FAX 916 683-1702

Kevin Hudson
Project Manager
IEC
8795 Folsom Blvd, Suite 205
Sacramento, CA 95826

Dear Kevin:

Thank you for last Friday's presentation on the water use and discharge plans for the proposed Cosumnes River Power Plant.

As you know, The Nature Conservancy is working (on our own and with partners such as CALFED, the Fisheries Foundation, and the USFWS) to restore the salmon fishery of the Cosumnes River. That fishery has been heavily impacted by the decline in flows in the Cosumnes River that has resulted from historic and ongoing groundwater overdraft. We will be working with Sacramento County, SMUD, and other stakeholders in the Central Sacramento County Groundwater Forum to address these issues and attempt to find a long term solution.

From the standpoint of this larger problem of loss of Cosumnes River flow to groundwater, SMUD's proposed discharge of cooling water to Clay Creek may have a small positive effect. Since Clay Creek ultimately joins Laguna Creek, and Laguna Creek joins the Cosumnes in the tidal zone, below the seasonally dry reach of the river, the flows will not directly enhance conditions for migratory fish. However, if some of the discharge to Clay Creek will be diverted by agricultural users who would otherwise pump groundwater, the discharge may have a small indirect benefit on groundwater levels in the Galt groundwater basin. Some of the discharge will also be absorbed into the underlying soil strata. If this absorption occurs in a reach where the stream is connected to groundwater, this absorption may also benefit groundwater levels. However, we expect that most of the stream reaches in question are disconnected from the groundwater (as a result of historic and ongoing groundwater pumping), in which case this absorption would not benefit the aquifer.

The other potential issue associated with the proposed discharge is that, as a general rule, dry season discharges to historically intermittent streams tend to benefit non-native invasive species of fish at the expense of native fish. A perennially wet Clay Creek may have developed a population of exotic fish (such as largemouth bass and green sunfish) that are problems for natives, and periodic high flow conditions may provide an opportunity for those fish to migrate downstream to Laguna Creek and the Cosumnes. This is unlikely to be a significant problem, however, because these non-native fish are already abundantly present in the Cosumnes River, and there are many existing reservoirs

of habitat for non-natives (farm ponds, other impoundments, and other dry season dischargers) within the Laguna Creek drainage.

We recommend that SMUD initiate and maintain a program to monitor both groundwater conditions and the fishery within the area potentially impacted by discharges. Ideally, from our perspective, this monitoring would be coordinated with or carried out by researchers from UC Davis's Watershed Center. The Center, headed by hydrologist Professor Jeff Mount, is engaged in long term monitoring of fish, groundwater, and other key ecological indicators in the Cosumnes River watershed. At a minimum, any monitoring carried out by SMUD should be coordinated with UC Davis so as to provide maximum research value. The coordinator of Cosumnes watershed research is Ellen Mantalica. She can be reached at (530) 754-9133 or by email to <Mantalica@Crocker.ucdavis.edu>.

Finally, as you know, we have been working with SMUD and its consultants for well over a year on the permitting and access issues associated with the need for a pipeline routing under lands owned by the California Department of Fish and Game and managed as part of the Cosumnes River Preserve. Jaymee Marty of my staff has made some suggestions for adjustments to the route to avoid impacting vernal pools but she has not received confirmation from SMUD as to a final alignment. If you could contact Jaymee (916 683 1741 or jmarty@tnc.org) with this information, that would be helpful. Overall, we appreciate your willingness to cooperate with us on the pipeline routing and we are comfortable that the pipeline project can proceed without creating any significant impacts on the natural resource values of that area.

Sincerely,



Mike Eaton

Cc: Ramona Swenson
Keith Whitener
EJ Koford

COSUMNES POWER PLANT (01-AFC-19)
DATA RESPONSES, SET 3B

INSERT

Figures BR-197a and b

Biological Resources Around the Transmission line Towers

COSUMNES POWER PLANT (01-AFC-19)
DATA RESPONSES, SET 3B

Attachment BR-200

Email from ACOE

-----Original Message-----

From: Finan, Michael C SPK [mailto:Michael.C.Finan@usace.army.mil]

Sent: April 23, 2002 9:47 AM

To: Koford, EJ/SAC

Subject: RE: CPP: Need for letter for CEC

Absent another federal agency having prior or higher magnitude involvement in the project, and assuming the work would involve unavoidable discharges of dredged or fill material into jurisdictional waters, we would initiate consultation under the Endangered Species Act for any work which requires a Corps permit which may affect federally listed species or critical habitat. We would also take appropriate actions to insure any permitted work complies with other applicable federal laws, including the National Historic Preservation Act.

COSUMNES POWER PLANT (01-AFC-19)
DATA RESPONSES, SET 3B

Attachment BR-203

Exhibit 1 from the Davis Environmental Consulting report

[3 copies of this figure were provided to CEC.]

COSUMNES POWER PLANT (01-AFC-19)
DATA RESPONSES, SET 3B

Attachment BR-206

Wetland Delineation Maps and Data Sheets

[3 copies of the map set and data sheets were provided to CEC.]

COSUMNES POWER PLANT (01-AFC-19)
DATA RESPONSES, SET 3B

Technical Area: Noise

Author: Jim Buntin

CPP Authors:

BACKGROUND

Discussions during the site visit suggested that the mobile home on Clay East Road might be moved. If this were to occur, the noise analysis should be revised to describe potential impacts at the more distant residences.

DATA REQUEST

220. If the mobile home is to be relocated, please revise the noise analysis to address compliance with the noise standards at the subsequent nearest residences.

Response: The noise levels at the next nearest residences are 45 and 42 dBA as shown in the Figure 8.5-2R of Supplement A with modeling data provided in response to Data Request #218 (Data Response, Set 3A). As stated in Section 8.5.2.2.3 of the AFC, the most restrictive local standard applicable to CPP is the 45 dBA L50 nighttime (10 p.m. to 7 a.m.) residential standard set forth in the Sacramento County General Plan. The predicted levels at the residences beyond the trailer comply with this standard.

Plant levels are compared to various ambient metrics historically requested by the CEC in Table NO-220.

TABLE NO-220
Comparison of Plant and Ambient Noise Levels (dBA)

Metric	Ambient Level	Plant Level	Difference	Plant Level	Difference
24-hour Average L90	35	45	10	42	8
10 PM to 7 AM Average L90	39	45	6	42	4
10 PM to 5 AM Average L90	38	45	7	42	5
Quietest 8-hour Average L90	33	45	12	42	10
Quietest 4-hour Average L90	32	45	13	42	11
Quietest Hourly L90	28	45	17	42	15

COSUMNES POWER PLANT (01-AFC-19)
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The comprehensive survey included all of the following aspects.

- 100% of 76 acres (308,000 sq. meters) of land within the Rancho Seco Owner-Controlled Area were surveyed.
- All survey areas were verified to be non-impacted with no contamination in excess of background detected.
- Over 80,000 gamma spectra were collected and processed during the survey project.
- Sensitivities between one and two orders of magnitude less than Derived Concentration Guidelines were achieved.
- Performance tests consisting of repeated grids and grids "salted" with check sources were completed.

231. Please provide a schedule for the decommissioning of the Rancho Seco Nuclear Power Plant. Please also include what steps will be taken to prevent migration of any hazardous wastes, including radioactive wastes, from Rancho Seco to the proposed Cosumnes Power Plant site and laydown areas. Also list the number of truck trips removing hazardous or radioactive wastes from Rancho Seco if these trips will occur during CPP site preparation and operations.

Response: The current schedule for RSP decommissioning calls for CFR Part 50 license termination in 2008. All spent fuel should be moved to the Independent Spent Fuel Storage Installation (ISFSI) by late 2002. Between now and the end of 2006, the completion of systems removal, spent fuel pool removal, large component removal and building decontamination will be accomplished. The major activities in 2007 and 2008 will be the completion of final radiological survey activities and data submittal to the Nuclear Regulatory Commission (NRC).

The majority of hazardous waste has already been removed from RSP. All underground storage tanks have been removed. Ninety-nine percent of the asbestos has been removed and shipped for proper disposal. Chemicals and chemical systems necessary for plant operation have been removed and disposed. Hazardous material control programs are in place for the small quantities that are still in use. The only planned cleanups other than building demolition is for small oil-contaminated areas within the RSP industrial area. These small areas of oil contamination are isolated and not within the CPP site area. These activities should have no impact on the CPP site.

The control of radioactive material is mandated by NRC regulation and plant procedures. Regular surveys ensure that no radioactivity gets beyond the controlled areas that are designed to contain that material. There are expected to

Technical Area: Waste Management

Author: Alvin Greenberg, Ph.D.

CPP Authors: Kevin Hudson

BACKGROUND

The Phase I Environmental Site Assessment for the power plant site and construction laydown areas prepared by Taylor, Hooper & Wiley and submitted by SMUD as part of Data Response Set 2C (March 19, 2002) is not complete. No conclusion or recommendation was provided nor was an adequate discussion provided concerning the potential for impacts that the construction or operation of Rancho Seco Nuclear Power Plant could have had on the 30-acre site or laydown area. DTSC, along with Energy Commission staff, has concerns that waste materials, including radioactive wastes, may have migrated onto the site or laydown area.

DTSC and the Energy Commission understand that the Nuclear Regulatory Commission (NRC) is responsible for licensing nuclear facilities and maintains regulatory responsibility for activities conducted within the licensed areas. The Department of Health Services (DHS) holds jurisdiction for radioactive waste/material activities outside of the NRC's license domain.

DATA REQUEST

230. Please prepare and implement a Sampling and Analysis Plan for the site and laydown areas. This plan should also include a survey and results for the presence of radioactive materials. Please submit this Plan along with an Implementation Schedule to Energy Commission staff and DTSC for review and approval prior to implementation.

Response: The Applicant objected to development of a Sampling and Analysis Plan in its letter to the Energy Commission on April 15, 2002. Although the Applicant maintains that the activities at Rancho Seco Plant (RSP) are outside the jurisdiction of the CEC, it is willing to share relevant information that is not restricted. Therefore, the Applicant conducted a data search to determine if information was readily available that could assist the Energy Commission with its concern about potential radiological contamination of the CPP site. As standard practice at RSP, a radiological survey was performed in late 2000. The survey addressed areas outside the RSP security fence (including the CPP site) except for the RSP liquid effluent discharge pathway. The survey included direct surveys (both fixed and moving scan) as well as sampling and analysis. The survey was designed in accordance with Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) survey guidelines. No activity of plant origin above background levels was found.

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DATA RESPONSES, SET 3B

be 40 to 60 truck shipments per year for 2002 and 2003. After 2003, the rate should drop, ending by 2007. All RSP traffic enters and leaves the site by access road to the northeast of the plant, well away from the CPP site.

232. Please provide a description and area map of Rancho Seco's Nuclear Regulatory Commission licensed boundaries and buffer zones.

Response: The owner-controlled area under the jurisdiction of the NRC is all of the property owned by SMUD surrounding RSP. Within the owner-controlled area is the protected area, which is the interior fence line surrounding the RSP facilities.

Technical Area: Water and Soil Resources

Author: Philip Lowe, P.E., Greg Peterson, P.E., and Richard Latteri

CPP Authors: EJ Koford

BACKGROUND

On November 12, 2001, a Well Drillers Inspection Request was provided to the applicant by facsimile. To date, no well data within the vicinity of the CPP site has been provided.

DATA REQUEST

241. Please provide at least 10 representative well logs within a 2 mile radius of CPP including estimated yield, quality, and water level.

Response: Five copies of the requested well logs are provided as Attachment W&SR-241 under a request for confidentiality. As the CEC staff is aware, these logs are confidential and according to the terms of the water code may not be duplicated or distributed outside the authorized governmental agency.

242. Figure 8.15-2 is too generalized and does not provide adequate detail. Please provide geomorphic strata and groundwater depths within the hydrologic area; specifically at the plant site.

Response: Figure 8.15-2 represents the best geomorphic figure that was found in existing reports. However, the well log information provided in response to Data Request #242 above, includes information about various formations detected in wells in the vicinity, as well as depth to groundwater. In addition, Figure W&SR-242 shows the Sacramento County Groundwater contour map as reported by the Sacramento County Department of Public Works.

BACKGROUND

Data Requests 118, 119, 120, 121, and 122 requested a draft Storm Water Pollution Prevention Plan (SWPPP) and draft erosion control and sedimentation plan. The responses provided in Set 1C and AFC Supplement A included a preliminary draft SWPPP and a new site plan. The preliminary draft SWPPP is inadequate and does not apply to the new site configuration as noted in Data Response 118, which states that the draft SWPPP is to be revised once the new grading plan is received.

Data Requests 133 and 134 requested hydrologic calculations and a hydrologic reservoir routing analysis for the proposed stormwater detention basin. Data Responses 133 and 134 in Set 1A and Set 1B provided rough hydrologic calculations and a rough estimate of the volume required for the stormwater detention basin but no information was provided on the proposed storage/outflow characteristics of the basin.

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Hydrologic reservoir routing is typically based on an inflow hydrograph, the basin geometry, and outflow characteristics. No hydrologic reservoir routing was provided.

Data Request 136 requested analysis of other return periods, plus a conceptual spillway design. Data Response 136 in Set 1C states that “the Applicant will attempt to move this item up in the design queue.” To date, no information has been provided for Data Request 136.

Data Request 138 requested proposed and existing contours on grading plans to include drainage features and the laydown areas. The figure should distinguish those areas that will be routed to the blow-down treatment systems, the stormwater detention basin, and other areas as initially requested. At the meeting on January 9, 2002, the applicant committed to providing a response to this request. Areas to be routed to the blow-down treatment systems are not yet described.

DATA REQUEST

244. Please provide the revised draft plans (grading, erosion control & sedimentation, and SWPPP) as initially requested in Data Requests 118 through 122.

Response: The SWPPP previously submitted as Attachment W&SR-118 (Data Response, Set 1C) has been revised. Revisions are shown in strikeout/underline mode. The revised Preliminary Draft SWPPP is provided as Attachment S&WR-244.

245. Please provide a conceptual stage/storage/outflow relationship for the proposed stormwater detention basin with a hydrologic reservoir routing based on an inflow hydrograph, the detention basin geometry, and stage/storage/outflow characteristics.

Response: The design and construction of the storm water detention pond will be based on earthen embankment design considerations. For the current size of the pond, a depth of 4 feet at the deepest point is expected to achieve the storage capacity necessary to detain the required storm water runoff volume. This volume is the storm water runoff volume that is required to be withheld to ensure that the peak discharge rate for a 10-year, 24-hour storm is not greater after construction than the peak discharge rate prior to construction of the power plant. A typical embankment design for this type of pond is shown in Calculation 13578A-C-2. (These calculations are provided as Attachment W&SR-245). The final design will be a function of the soil investigation as well as the final relationship with the discharge point into Clay Creek.

Volume detention requirements are established as being the volume difference between the flow from the site before construction and after for a 10-year, 24-hour storm. This rate has been established as 0.83 cubic feet per second (cfs). The outflow design will be based on discharging collected storm water through a

COSUMNES POWER PLANT (01-AFC-19)
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low point outflow pipe. The discharge rate will be a function of the hydrostatic head and a calculation was performed to establish the outflow pipe size versus head to achieve the desired 0.83 cfs. A pipe size that would achieve this flow rate would be between 4 and 5 inches in diameter for a hydrostatic head greater than 1.5 feet (see Calculation 13578A-C-2, Attachment W&SR-245). Since a pipe of this small diameter would likely be prone to blockage or restriction, the final design would incorporate an inlet metering orifice and use a larger pipe with a diameter of 10 to 12 inches. This larger pipe size would also reduce the discharge velocity. The inlet design would be such that it prevents blockage.

A calculation was performed to establish the portion of the pond volume that is above the 1.5-foot depth. The analysis determined that essentially 86 percent of the pond volume would be above the 1.5-foot depth. (See Calculation 13578A-C-3, Attachment W&SR-245) Based on this, the assumption for constant outflow of 0.83 cfs over the duration of the filling and drainage of the pond for the 10-year, 24-hour storm appears to be a good approximation. Therefore, the hydrograph developed previously for Data Responses #134 and #135 are a valid representation of the flow hydrograph showing that the pond discharge rate will be close to 0.83 cfs over the 34-hour period that it takes to drain most of the detained storm water. Note in the hydrograph as shown on sheet 5 of Calculation 13578A-C-1 (Attachment W&SR-245) that the RUNOFF (cfs) is actually the average runoff over the time period represented on the x-axis. Therefore, the pond is drained when the average runoff equals the average outflow (0.83 cfs) at the 34-hour rainfall duration time. In that same calculation, sheet 7 shows the peak pond volume is reached at the 12-hour rainfall duration time.

The design of the pond embankment will allow for storms up to the 100-year, 24-hr storms by including freeboard above the 4-foot depth of approximately one foot. Included also will be a broad crested weir to handle the inflow volumes greater than the design basis. Typical design of a broad crested weir is shown in on sheet 2 of Calculation 13578A-C-4 (Attachment W&SR-245). The difference between a 10-year and 100-year storm is that the 100-year storm is 50 percent greater in rainfall intensity over the storm duration than the 10-year storm (see sheet 3, calculation 13578A-C-1, Attachment W&SR-245). A freeboard of one foot will be more than adequate to handle the additional 50 percent inflow. Final weir design will be based on pond relationship to Clay Creek, the final location of crested weir, and the design for accommodation of spill discharge without disruption of the flow in Clay Creek. The flow from a storm in excess of a 10-year, 24-hour storm could result in flows across the weir up to 14 cfs for a short period of time.

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246. Please provide a stormwater management design that complies with all requirements of the CVRWQCB and Sacramento County. If the original design exceeds those requirements, please provide a detailed discussion of the exceedences.

Response: The management of the storm water runoff volumes is addressed in Data Response #245 as well as the general design considerations for the embankment and broad crested weir. Details of the collection system, oil separation, and outflow line will be developed during the detail design phase of the project and reflect the final location of equipment, various surfaces, and the proximity of Clay Creek. Under the requirements of the NPDES Industrial Stormwater Permit process, the CVRWQCB will have final approval of the actual design and their approval would constitute an agreement by the CVRWQCB that the design meets or exceeds the required storm water management requirements.

BACKGROUND

Data Requests 143, 144, 145, and 146 requested hydrologic and hydraulic documentation of the flood conditions that would be experienced by the CPP site.

Data Response 143 through 146 in Set 1G provided a hydrologic and hydraulic analysis that is adequate for existing conditions on Clay Creek but no information is provided for tributaries to Clay Creek, which are to be diverted by the CPP site. Some additional clarification is needed. Specifically, the Clay Creek 100-Year Discharge Analysis Report states that a portion of the CPP site is within the Clay Creek floodplain but no map showing the location of this flood-prone area is provided.

With regard to tributary flows, the site plan shows two tributaries that would be diverted by the project. Since the entire flow for those tributaries will be diverted, it is not necessary to map the 100-year floodplain through the property for those tributaries. However, the environmental evaluation should include an estimate of the magnitude of those discharges and a preliminary description of the collecting structures and diversion pipes in order to assess whether these flows can safely be collected and diverted without overflowing into portions of the project site not designed to accept this flow.

The report states that 100-year flow velocities adjacent to the proposed banks of the facility are low, and with good engineering and erosion control (vegetation), the slopes surrounding the facility can adequately protect the facility from being eroded, undermined or over-run. However, no information is provided on post-development flow velocities at locations where the proposed facility (which includes the proposed stormwater detention basin) would encroach into the floodplain. Without post-development flow velocity information it is difficult to determine whether vegetative

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treatment of these slopes will be adequate as erosion control or whether non-erosive armoring (such as riprap) may be necessary.

The report further states that the project will be elevated by grading to be above the 100-year flood elevation of Clay Creek. Although this is a commonly-accepted method of flood protection, in this case it also involves filling and diverting one of the tributaries of Clay Creek which results in impacts to waters under the jurisdiction of the U.S. Army Corps of Engineers and the California Department of Fish and Game. The Corps of Engineers typically requires that impacts to waters of the U.S. be avoided where possible. Consideration should be given to modifying the site to avoid encroachment into the stream channel.

DATA REQUEST

247. Please provide a map showing the location of the 100-year floodplain of Clay Creek which includes the water surface elevations on and adjacent to the CPP site.

Response: Figure W&SR-247 shows the location of the 100-year floodplain of Clay Creek based on HEC modeling previously provided to the CEC staff. See also, Figure W&SR-250a.

248. Please provide 100-year discharges for the Clay Creek tributaries that will be diverted by the CPP (Waananen and Crippen method is acceptable).

Response: The 100-year peak discharges for the Clay Creek tributaries that will be diverted by the CPP was estimated using the Waananen & Crippen regional curve method (1977). The Waananen & Crippen method separates the state of California into six hydrologic regions and uses regression equations generated for each region to determine peak runoff for a drainage area and recurrence interval. The Rancho Seco Plant (RSP) is located within the Sierra hydraulic region. The peak discharge for a 100-year event in the Sierra hydraulic region is calculated by:

$$Q_{100} = 15.7 A^{0.77} P^{1.02} H^{-0.43}$$

where Q_{100} is the peak discharge for a recurrence interval of 100 years (cfs), A is the drainage area (mi²), P is the mean annual precipitation (in), and H is the altitude index (thousands of feet).

The areas for the “east” and “west” tributaries to Clay Creek (the drainages immediately east and west of the existing access road from Clay East Road to the proposed project site) were delineated on the United State Geological Survey (USGS) Goose Creek and Clay Quadrangles. The drainage areas were measured with a planimeter as 0.195 and 0.303 square miles, respectively. The basin lengths

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for each tributary from the project site to the drainage divide were also measured following the principal channel. The altitude index for each tributary was determined by calculating the average of the principal channel's elevation at 10 percent and 85 percent of the basin length. The final basin lengths were calculated as 6,000 and 8,600 feet and the final altitude indices were calculated as 0.180 and 0.173 thousands of feet for the east and west tributaries, respectively. The relief of each basin (100 and 120 feet, respectively) was determined by taking the difference between the elevation at the project site and the elevation at the drainage divide. The average annual rainfall for RSP was calculated as 16.72 inches by computing the mean of the total annual rainfall recorded by the East Bay Municipal Water District at Clay Ranch from 1931 through 1980. Table W&SR248-1 summarizes the input and results of the Waananen & Crippen Method for each tributary to Clay Creek. The 100-year discharge for the east tributary was calculated as 165 cfs and the 100-year discharge for the west tributary was calculated as 236 cfs.

TABLE W&SR248-1
Waananen & Crippen Method Summary Table

Tributary	Drainage Area (mi ²)	Precipitation (in)	Altitude Index (1000s of feet)	Discharge (cfs)
East	0.195	16.72	0.180	165
West	0.303	16.72	0.173	236

249. Please provide conceptual descriptions and hydraulic capacities of the catchment and conveyance structures for the tributary flow to be diverted. The descriptions should be sufficient to assess whether capturing and diverting this flow as shown on the site plan is practical.

Response: Figure 8.14-4R in AFC Supplement A shows the proposed grading and drainage plan for the site. There are two shallow swales that presently cross under the proposed site plan, draining areas south of Clay East Road. For this discussion, consider them the "east and west swales" (see Figures W&SR-249a and b). The wetland delineations prepared by Davis Environmental (Attachment BR-203) show the west swale to be of average 1-foot width on the north side of Clay East Road, and approximately 1-foot depth over a broad grassy swale. On the south side of Clay East Road is a small detention pond formed by the elevated road that acts as a hydraulic control to storm flow through this area. The culvert under the road is approximately 24 inches in diameter, and during rainfall events observed in December 2001, was filled to a depth of 2 to 3 inches. Downstream (north) of Clay East Road, this swale is broad and shallow and shows clearly only during rainfall (Figure W&SR-249b). That is, the channel is not incised or eroded, implying low flow velocities. There were no indications in

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the field that this drainage had ever overtopped the road, nor any significant scouring under the culvert.

The eastern swale (Figure W&SR-249a) is more defined, consisting of a slightly incised channel shown on wetland delineations as 2 feet wide, and between 2 and 4 feet below local topography. It also is conveyed under Clay East Road by a 24-inch diameter culvert that was filled to a depth of 3 to 4 inches in December 2001. The channel is more defined and even scoured in some places north of Clay East Road, but there is no evidence of flows overtopping the road, nor scouring at the base of the discharge culvert.

Together these swales drain an area of approximately 122 acres (derived from USGS topographic maps) of annual grassland used for grazing pasture. There are no gaging stations or other measuring devices in the drainage.

Figure 8.14-4R in Supplement A shows these two swales would be diverted by culvert from the location where they emerge on the north side of Clay East Road; the east swale to the east and the west swale to the west around the proposed project site.

The hydraulic capacity of the drainage is theoretically limited by the size of the culverts that exist on the site, and the culverts that would be placed by CPP would be of the same diameter as the existing culverts. Therefore, because the conditions in the drainage basins upstream of Clay East Road will not be altered as a result of this project, it is expected that the new culverts will be adequate to convey similar storm flow rates as the existing culverts.

If the east or west swale have ever over-topped the culverts, there is no evidence of it in the field (e.g., no erosion of road or scouring of plunge pools under the culverts). Because the road is approximately 2 to 5 feet above the elevation of the adjacent area south of the road, it appears that if greater flows than could be conveyed through the culverts were to occur, water would pool between Clay East Road and the low swales adjacent to it. However, indications in the field are that this road has not overtopped and that the existing culverts convey flows adequately.

250. Please provide post-development flow velocities adjacent to structures proposed to be within the 100-year floodplain including the detention basin if applicable. Please provide the rationale for determining whether these flow velocities are low enough to allow vegetative erosion protection, or whether a non-erodible lining is required.

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Response:

Flow Velocities: The Hydrologic Engineering Center – River Analysis System (HEC-RAS) model, developed to predict the 100-year water surface elevations for the CPP, was used to predict post-development flow velocities adjacent to structures proposed to be within the 100-year floodplain. The details of the HEC-RAS model are presented in *Technical Memorandum 1: Clay Creek 100-Year Discharge* (Attachment W&SR-144, Data Response Set 1G). The HEC-RAS flow distribution capability was used to determine flow depths and velocities adjacent to structures proposed to be within the 100-year floodplain. The flow distribution routine in HEC-RAS divides flow through a cross section into a specified number of cells and then applies Manning's equation using local hydraulic geometry to determine the flow depth and average velocity through each cell.

Flow depth and velocity distributions were calculated for cross sections in the HEC-RAS model where proposed structures were within the 100-year floodplain (see Figure W&SR-250a). Figure W&SR-250b is an example velocity distribution for cross section 2214. Specific velocities for the cells adjacent to proposed structures within the 100-year floodplain are summarized in Table W&SR250-1. As expected, the velocities outside the primary Clay Creek channel and adjacent to the structures proposed to be within the 100-year floodplain are low (from 0.58 – 0.73 feet per second).

TABLE W&SR250-1

Velocities and mechanical force of flowing water adjacent to the structures proposed to be within the 100-year floodplain
Local slope of 0.065 used in the calculation of mechanical forces using the depth slope approximation (Julien 1998).

Cross Section	Floodplain Structure Station (feet from left bank)	Velocity at Station (ft/sec)	Flow Depth (ft)	Mechanical Forces (lbs / ft ²)
2214	928	0.69	0.55	0.22
2338	1031	0.73	0.26	0.11
2861	1225	0.58	0.42	0.17
3069	1472	0.71	0.28	0.11
3311	1212	1.70	1.43	0.58

Erosion Protection: The mechanical forces associated with depths and velocities adjacent to the structures proposed to be within the 100-year floodplain were identified to determine whether vegetative erosion protection would be sufficient in the event of a 100-year storm. The depth-slope approximation (Julien 1998) was used to calculate shear stress for the cell at each cross section adjacent

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to the structures proposed to be within the 100-year floodplain and then converted shear stresses to mechanical forces. The mechanical forces for each cross section are presented in Table W&SR250-1. Table W&SR250-2 presents maximum recommended mechanical forces for a range of vegetative bank protection measures (Schiechtl and Stern 1994). The mechanical forces predicted for a 100-year event at the site range from 0.11 to 0.58 pounds per square foot. Vegetative erosion protection similar to the types listed in Table W&SR250-2 will be sufficient to withstand all the forces except the force at cross section 3311 immediately after construction. After 3 to 4 years, vegetative erosion protection will be sufficient at all locations at the proposed site. Therefore, some short-term, biodegradable erosion control fabric should be considered in the vicinity of cross section 3311 to protect against erosion immediately after construction. Vegetative protection should be sufficient at all other locations.

TABLE W&SR250-2

Maximum permissible mechanical forces for vegetative erosion control
From Schiechtl and Stern (1994)

Construction Material	Post- Construction (lbs / ft ²)	After 3-4 Years (lbs/ft ²)
Turf	0.20	2.05
Wattle Fence	0.20	1.02
Willow Brush Layer	0.41	2.87
Reed Planting	0.10	0.61
Live Fascine	1.23	1.64

References

Julien, P.Y. 1998. Erosion and Sedimentation. Cambridge University Press. Cambridge, U.K. 280pp.

Schiechtl, H.M. and R. Stern. 1994. Watercourse Bioengineering Techniques. Blackwell Sciences. Cambridge, MA. 186 pp.

Waananen, A.O., and J.R. Crippen. 1977. Magnitude and frequency of floods in California. US Geological Survey Water-Resources Investigations 77-21.

BACKGROUND

Data Request 147 requested mapping of riparian areas affected by the pipeline construction. Data Request 148 requested evidence of consultation with the U.S. Army

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Corps of Engineers, CVRWQCB, and California Department of Fish and Game regarding the proposed riparian disturbance. Evidence of consultation should include applications for a 404 Permit, 401 Water Quality Certification, and a California Fish and Game Code 1601 Streambed Alteration Agreement. Data Responses 147 and 148 in Set 1A and Set 1D stated that mapping and 401, 404 and 1601 permit applications are being prepared.

DATA REQUEST

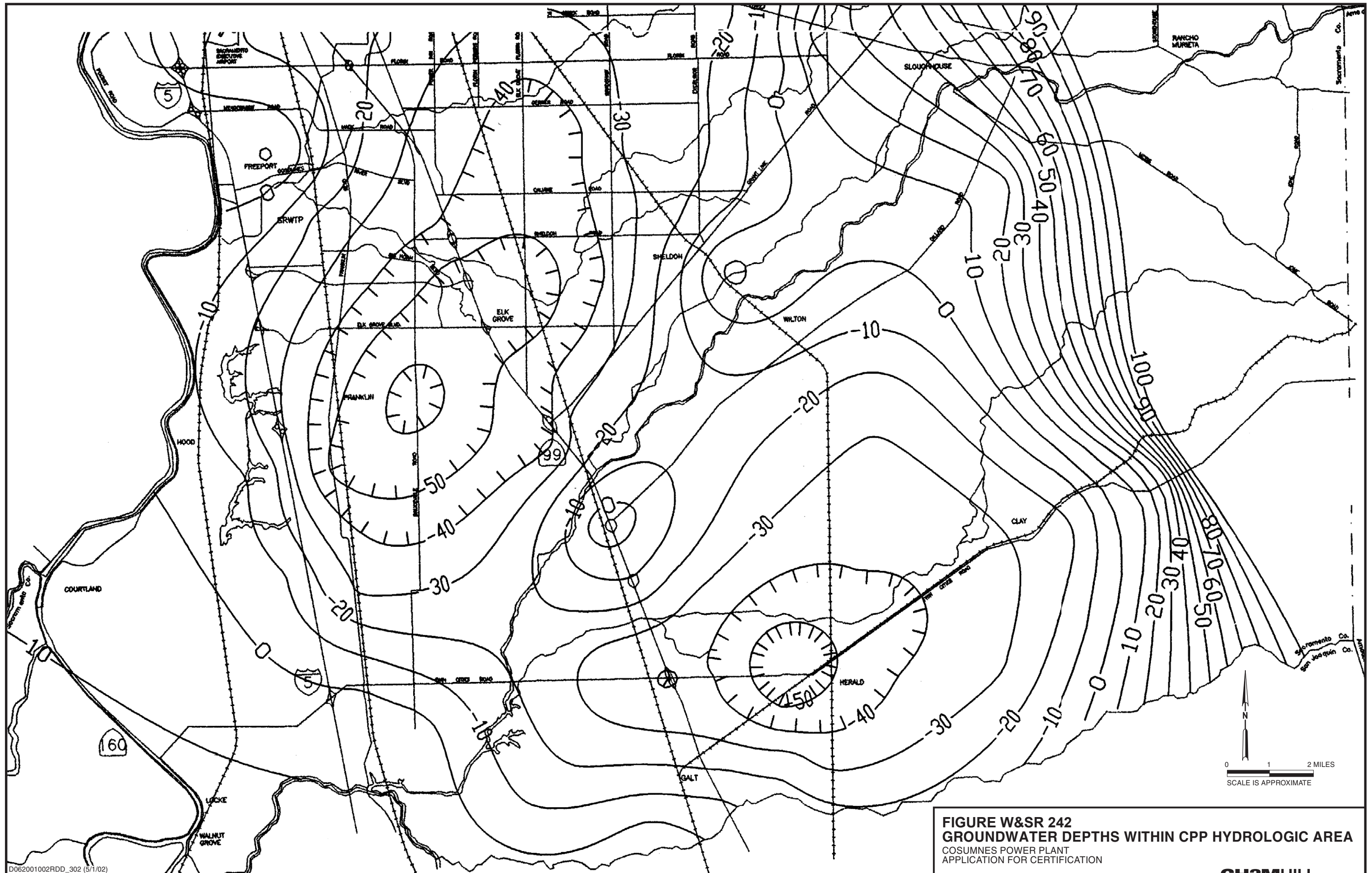
251. Please provide the mapping and completed applications referred to in the responses to Data Requests 147 and 148.

Response: Please see Data Response #201 for a schedule of permit submission.

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Attachment W&SR-241
Representative Well Logs

[5 sets of well logs were submitted under a request for confidentiality]



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INSERT

Attachment W&SR-244

SWPPP, Revision 1

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INSERT

Attachment W&SR-245

Detention Basin Routing Analysis Calculations

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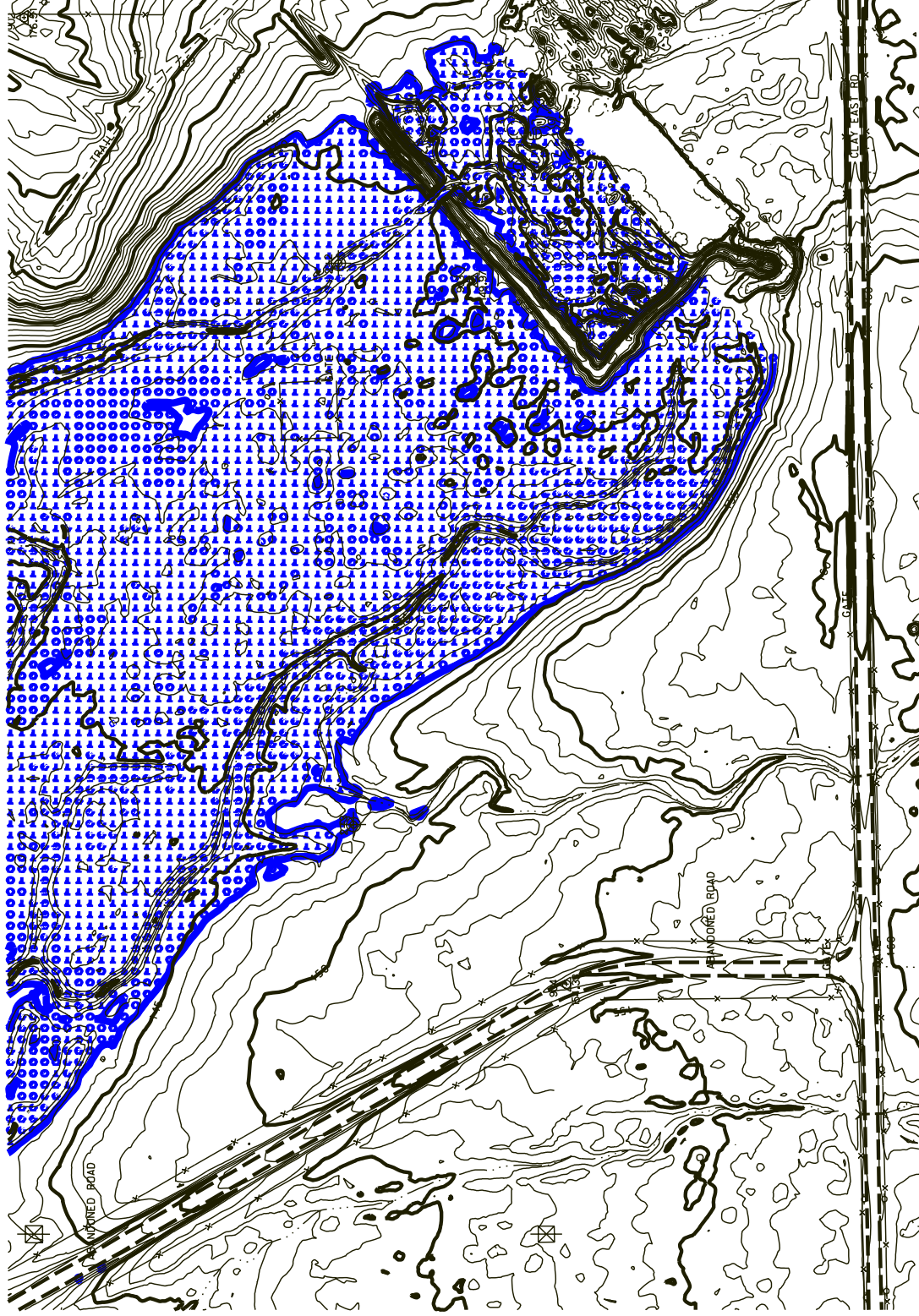


Figure W&SR-247. 100-year floodplain of Clay Creek, calculated for area adjacent to CPP.

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Figure W&SR-249a. “East” swale north of Clay East Road, December 30, 2001.



Figure W&SR-249b. “West” swale, north of Clay East Road December 30, 2001

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INSERT

Figures W&SR-250a and b

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SMUD's COSUMNES POWER PLANT PROJECT
APPLICATION FOR CERTIFICATION,
DOCKET NO. 01-AFC-19

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I declare that I transmitted the foregoing document via e-mail, or as indicated by first class postal mail, to the above named on the date indicated thereby. I declare under penalty of perjury that the foregoing is true and correct.

Anar Bhimani
Administrative Assistant